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Developing collaboration and dialogue in contractor forestry: a case study in the tradition of realist evaluation

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ABSTRACT

This study describes and evaluates a long-term training program to improve dialogue between clients and contractors in two forestry companies. A comparative case study design was used. Interviews were conducted at three points: prior to training ($n=28$), three months after completion ($n=30$), and at a seven-year follow-up ($n=14$). Analysis resulted in a program theory formulated as a context-mechanism-outcome (CMO) configuration to guide future dialogue-based training in interdependent forestry systems. In contexts characterized by diverse expectations, varied role understandings, and differing organizational cultures, sustainable change depends on both individual and structural factors. Central mechanisms include fostering shared understanding of roles and the forestry value chain, developing dialogical skills (e.g. active listening, reflection, feedback), linking training to everyday work practices, supporting psychological safety and constructive conflict engagement, and ensuring sustained organizational follow-up. These mechanisms are associated with short-term improvements in openness, trust, and teamwork; medium-term application of dialogical skills in cross-organizational collaboration; and long-term normalization of feedback practices and sustained cooperation. Lasting impact depends on participant preparation, alignment of expectations, practical relevance, and organizational support. Overall, the study shows that dialogue-based training can achieve lasting organizational change when embedded in supportive organizational contexts that reinforce learning and collaboration over time.

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Introduction

Sweden's forest sector is a major contributor to the national economy and accounts for approximately 9–12% of Sweden's industrial employment, exports, and value added, supporting around 140,000 jobs. The Swedish forestry industry is organized as an integrated value chain connecting forest owners, harvesting and transport contractors, and wood-processing industries. It is based on a mixed ownership structure, with private individuals, forest companies, and the state as the main forest owners, and is strongly oriented toward export markets (www.forestindustries.se).

Forestry services, including harvesting operations, are mostly carried out by contractors. The proportion employed by contracting companies is about 85% of the workforce (Swedish Forest Agency 2020). Swedish logging contractors are predominantly small, owner-managed enterprises providing mechanized harvesting and forwarding services under contract to forest companies and forest owner associations. Their operations are

highly capital-intensive and characterized by substantial investments in machinery, relatively low operating margins, and limited influence over contract prices. Consequently, profitability depends on maintaining high machine utilization and productivity while managing fluctuations in fuel, labor, maintenance, and financing costs. In addition, contractors face increasing technological, environmental, and regulatory requirements that require continuous investment and adaptation, not least the transition to fossil-free operations (Häggström et al. 2013; Ager 2014; Häggström and Lindroos 2016; Gustafsson and Lindblad 2026).

How the contractors perform operationally impacts the forest industry supply chain immensely (Johansson et al. 2021). Important factors for achieving both productivity improvements and lower harvesting costs are good relationships and cooperation between contractors and clients (Larsson 2009; Erlandsson 2016). Greater focus on aspects such as training, developed knowledge exchange, motivation, trust, teamwork, good dialogue and effective communication are

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prerequisites mentioned in this context (Larsson 2009; Häggström and Lindroos 2016).

Based on interviews with production supervisors and contractors, Johansson et al. (2021) identified factors that drive or hinder contractor performance. Capability in terms of *resources and competence* was identified as most important hindrances and drivers by the production supervisors. For the contractors, *incentives* were regarded as most important for motivation, especially if they affected the economy negatively. *Relationships and collaboration* were also considered crucial factors by the contractors which affected their delivery, information and goal attainment. Both are dependent on profitability for their survival, but to achieve this, contractors must rely heavily on the relations and communications with the representatives of their clients. From the perspective of industry, contractors are only one factor among many in the complexities of the business chain. Consequently, contractors are not always given the highest priority. Frustrations can arise in both systems. Among forest management staff, it can happen when they experience that a contractor does not have the degree of competence or resources they expect, and among contractors when incentives are unsatisfying, when they lack essential information, or are not given the necessary conditions to perform their tasks (Johansson et al. 2021).

Problems associated with inadequate communication between forestry contractors and their clients, including insufficient information about planned harvesting operations, have been reported previously (Larsson 2009; Ager 2014). Limited information and short planning horizons may leave contractors with insufficient time to prepare for operations, for example by inspecting harvesting sites before work begins, and have been associated with increased work-related stress (Hultåker 2006). Communication has also been identified as a potential factor in organizational change in forestry, particularly where established work practices and attitudes need to be reconsidered (Södergren and Thor 2003).

Johansson et al. (2021) found that communication and relationships between contractors and forest management staff were associated with contractor performance and the achievement of operational goals. Because contractors' economic outcomes are partly dependent on their interactions with clients, the quality and predictability of these interactions may affect operational efficiency and business outcomes. Conversely, inadequate communication, changes to harvesting plans at short notice, and differences in incentives may increase the risk of operational disruptions and financial losses for both contractors and forest companies.

Coordination between forestry contractors and their clients requires the exchange and interpretation of

information concerning work requirements, operational constraints, and expected outcomes. This is particularly relevant in forestry because operations are conducted under variable site and weather conditions, and contractors must translate client requirements into decisions made during field operations. Differences in the interpretation of work objectives, responsibilities, and performance expectations may therefore contribute to misunderstandings and divergent expectations between contractors and clients.

Research on teamwork and organizational learning suggests that increasing the amount of communication does not necessarily resolve such problems. Effective collaboration instead requires processes through which participants can exchange relevant information, clarify interpretations, identify differences in expectations, and establish a shared basis for coordinated action (Salas et al. 2013; Kluger and Itzhakov 2022). Dialogue-based approaches, in which participants consider alternative perspectives and examine assumptions underlying their own positions, have been proposed as one means of supporting these processes (Döös and Wilhelmson 2011). Consequently, examining dialogue in contractor-client relationships is relevant not because communication is inherently beneficial, but because the way participants interact may affect how operational information, responsibilities, and expectations are interpreted and coordinated.

Research on team development and behavioral change provides support for structured, experiential approaches to developing interaction and collaboration skills. Training interventions incorporating practice, feedback, and reflection on work-related situations have been associated with improvements in individual and team performance, although effects vary with intervention design and organizational context (Kluger and DeNisi 1996; Salas et al. 2012, 2013; Lee 2022). Training is more likely to be effective when it addresses identified performance needs and is adapted to the organizational and task context rather than implemented as a generic intervention (Salas et al. 2012, 2013, 2025). Transfer of newly acquired behaviors to everyday work may also require opportunities for application, feedback, and follow-up; isolated training events are less likely to produce sustained behavioral change (Salas et al. 2025).

Most research in this area has examined change within a single organizational system rather than across organizational boundaries. To our knowledge, based on searches of Google Scholar, training interventions addressing relationships, communication, dialogue, and behavioral change have not yet been systematically implemented and evaluated in the forestry sector. This represents a research gap concerning how interventions aimed at interaction and

collaboration can be designed and evaluated between forestry contractors and their clients. Studying such an intervention across organizational boundaries may also provide insight into how interaction and behavioral change develop when participants operate within different organizational contexts and have partly different responsibilities and interests.

Against this background, this study describes and evaluates a long-term training program designed to improve dialogue between forestry clients and contractors. The research was initiated and funded by Skogforsk, one of the primary research organizations supporting the Swedish forestry sector. The training programs themselves were independently planned, implemented, and financed by the participating companies. Following positive pilot studies in communication training, company management identified the potential for a more comprehensive, long-term intervention to improve collaboration and contribute to sustained profitability.

The overall purpose of the training program was to support long-term profitability across the forestry value chain by strengthening dialogue and introducing structured procedures for discussions concerning operational performance and business development. More specifically, the program aimed to enable contractors and forest management staff to:

1. collaborate to create conditions for an effective and transparent follow-up culture;
2. develop a shared understanding of the entire process and of each other's working conditions;
3. function as coordinated teams despite representing different organizational systems; and
4. apply a structured model for evaluating completed work to enable constructive dialogue, strengthening role confidence, and fostering long-term business relationships.

Initial program theory

This study is situated primarily within the field of social psychology, with a focus on research on teamwork. The model for realist evaluation (Pawson and Tilley 1997) forms the scientific basis for this study. In realist evaluation, program outcomes are understood as arising through context-mechanism-outcome (CMO) configurations, whereby contextual conditions influence whether an intervention triggers mechanisms that generate particular outcomes. The aim is to develop program theory that explains not only whether an intervention works, but also how, for whom, and under what contextual conditions it produces its effects. The training program's four goals were organized around three main

themes which form the basis of the program theory: 1. Context (particularly patterns of collaboration and organizational understanding), 2. Teamwork, and 3. Learning a structured model for feedback.

Context

Contextual factors critically shape work and collaboration in all organizations (Pettigrew and Whipp 1991; Woods and West 2019; Sandahl and von Knorring 2023). One aim of the program was to foster an effective and transparent follow-up culture. Clear, well-functioning organizational structures are expected to facilitate mutual understanding and collaboration between representatives of different systems. Multiple open systems interact within the program, including large forestry companies, smaller contractor businesses, and the training system. To prevent communication and collaboration issues within such a complex structure, participants need a shared understanding of these distinct systems (Woods and West 2019).

Hypothesis 1: Effective and sustainable collaboration between contractors and forest management staff should be based on

1. A shared understanding of the entire forest chain, and
2. An understanding of each other's working conditions and realities.

Hackman (2002) and Salas et al. (2012) have studied the importance of the surrounding organization for people who are collaborating in teams within organizations. Their conclusions were that a work group functions better if it operates in a supportive organization that ensures that the team receives the resources it needs, opportunities for skills development, and where the teamwork is in line with the organization's overall goals. All levels of the organization (even those not directly involved, such as senior management) need to support and encourage the program.

Hypothesis 2: Within a training program to develop dialogue and teamwork in the different participating systems and between representatives of the systems, basic conditions for dialogue and communication must be in place, such as

1. Resources in terms of time and continued skills development, and
2. Support from senior management.

Teamwork

Usually, a team is thought of as a group that consists of members from the same organization. In this case, one

goal of the training was that individual contractors and members of forest management staff form teams with the common goal of creating the highest value for both the contractor and the client.

The following aspects of a well-functioning team were highlighted in the training. It is a distinguishable group of two or more people who interact and are dependent on each other to achieve set goals, which are clear, meaningful, challenging and engaging. The team should have a certain stability of membership and have a mandate to carry out its mission (Hackman 2002; West 2012; Salas et al. 2013).

Two competing logics were applied in the two participating companies (A and B). In company A it was assumed that it would be an advantage if contractors and forest management staff participated in the same program. In company B it was assumed that one must start with oneself to change relationships. By developing communication skills in interaction with colleagues, one can, according to this line of reasoning, assume that the skills will show in other business relations.

Hypothesis 3a: Developing teamwork between representatives of different systems requires the participation of members of both systems.

Hypothesis 3b: By developing teamwork and communication skills in one system, the skills will show in the interaction with members of other systems.

Experiential learning

The training in this project was based on the principles of experiential learning (Kolb 2014). According to these principles, knowledge that includes abilities, such as communication and dialogue, cannot be learned intellectually only, but must be practiced and reflected on. Kolb (Ibid.) described how this type of knowledge develops with 1. an *experience* that one 2. *reflects* on, which leads to some form of 3. *understanding or conceptualization*, after which one tries to 4. *act in a partially new way*, which leads to 5. *new experiences* that give rise to 6. *new reflection*, and so on.

Hypothesis 4: To influence the participants' attitudes and ways of being in relation to each other, the training must take its point of departure from their experiences of daily work.

Research has shown that experiential learning requires a sufficient degree of trust between course participants, in course management and in the organization-as-a-whole (Lencioni 2002; Wheelan 2005; Salas et al. 2025). Since conflict is inevitable in team development, methods are needed to handle them in a constructive way. There need to be clear agreements and

a readiness to hold each other accountable. When these building blocks are put in place, which requires attention from the trainers, leadership skills and knowledge of group dynamics, the members of the training group gradually become better at focusing on common goals (Lencioni 2002; Wheelan 2005).

Hypothesis 5: A training program aiming at the participants to acquire new attitudes and ways of being in work is a process which passes through different phases before trust and accountability can be established.

Aim

This study aims to describe a training program designed to strengthen dialogue between clients and contractors in contractor-based forestry, evaluate its short- and long-term effectiveness in achieving intended outcomes for forest management staff, contractors, and their collaboration, and examine and refine the theoretical assumptions underpinning the program.

Methods

Over the past decades, qualitative research has gained increasing acceptance and become more widely applied in scientific disciplines previously dominated by quantitative methods. There is growing recognition of the crucial role of context in social interventions. The complexity of different contexts makes randomized controlled trials in organizational settings nearly impossible to conduct. As qualitative methodologies have evolved, scholars have emphasized the importance of grounding such studies in theoretical frameworks that are clearly linked to the knowledge domain of the intervention under investigation (Malterud 2016).

As mentioned above, realist evaluation (Pawson and Tilley 1997) forms the scientific basis for this study. The initial program theory was based on descriptions of the training program, observations from training sessions, and discussions with the trainers. This approach allowed us to capture the implicit program theory that guided the design of the program. In realist evaluation, the program theory is typically formulated prior to implementation. In this case, however, this was not possible, as the research commenced shortly before the start of the already planned training, which had been developed in collaboration with the participating companies. Nevertheless, we consider that the program theory we formulated accurately reflects the mental models and intentions underpinning the implementation.

The refined program theory, the result of Realist Evaluation, was developed based on verification of the

underlying hypotheses. The analysis followed three sequential steps: (1) assessing goal attainment, (2) verifying the hypotheses, and (3) developing the refined program theory.

Within the framework of Realist Evaluation (Pawson and Tilley 1997), the Kirkpatrick Model (Kirkpatrick and Kirkpatrick 2006) also informed this study. The model, widely used in the evaluation of training programs, comprises four levels: (1) reactions (engagement, relevance, and satisfaction); (2) learning (knowledge, skills, attitudes, confidence, and commitment); (3) behavior (critical behaviors); and (4) organizational outcomes (e.g. established procedures).

The research project is a comparative process and case study, based on an empirical enquiry that investigates a phenomenon within its real-life context (Yin 2009). Some elements of action research (Greenwood and Levin 2006; McIntyre 2007) were also applied in the sense that researchers participated as observers at several training occasions and presented progress.

Ethical issues

Participants provided written consent, and data was anonymized. Interview material was handled confidentially, and in line with GDPR, participants could access, correct, delete, or restrict processing of their personal data. The study was approved by The Regional Review Board of Uppsala (Dnr 2016/113) and by the Swedish Ethical Review Authority (Dnr 2024-07746-02).

The training program

A program which consisted of training and supervision meetings was carried out during the years 2016–2018. Participants were forest management staff and contractor-owners hired by two forestry companies.

Company A is a business unit within the Company A Group. They employ about 500 people in four districts which cover all of Sweden. The unit manages Company A group's forests, procure wood for Company A group's Swedish sawmills, paper and paperboard mills. In addition, they purchase and sell wood from Swedish private forest owners, forest owner associations, and sawmills. The training program described in this report was carried out in a unit in the Southern District.

Company B manages Company B group's forest holdings. They employ about 700 people, mainly in the northern part of Sweden. Like Company A, they also procure wood for Company B group's Swedish sawmills, paper and paperboard mills. In addition, they buy timber from private forest owners and offer forestry services.

The project described in this report was carried out at a unit in the northern part of Sweden.

In Company A, forest management staff and harvesting and haulage contractors were included, whereas Company B chose to conduct the intervention with forest management staff only. The training program at each company lasted for a period of 1.5 years and started with a time lag of approximately 6 months.

The working format during the meetings was interactive. At the meetings, participants alternated between theory, individual work and group discussions. The framework for the program consisted of models on 1. How to build a functioning team, 2. Effective dialogue, and 3. Professional evaluation and feedback. These building blocks were practiced in different situations and for different topics during and between the meetings.

The training was centered around situations where dialogue was required. The situations most often worked with were joint analysis of the work performed when the so-called *feedback model* was applied. The basis of this model was that the person who performed a task was the expert when the result was to be evaluated. The performer started by describing how the work had progressed from his or her perspective, after which the other party provided feedback from their perspective on what was good and bad and why. The feedback given related to conditions and delivery of the work. The recipient then got a chance to react to the points of view that had been made.

At Company A, the initiative began in May 2016 and ended in December 2017. This included a total of 7 meetings: 4 training meetings and 3 supervision meetings. After an initial two-day meeting, the entire group met for one full day every six months. During the period between meetings, supervision was carried out in smaller groups on three occasions. Two days were set aside for the final meeting in December 2017.

The training at Company B began at the end of October 2016 and continued until the end of May 2018. A total of 9 meetings; 4 training meetings and 5 supervision meetings were carried out during the period. After an initial 2-day meeting, the entire group met for one day every six months. In addition, supervision was carried out in smaller groups on two occasions and in the whole group on three occasions. Two days were set aside for the final meeting in May 2018.

While Company A maintained the training's original focus on dialogue in the chain with several actors as participants, after some time Company B chose to shift focus to the group and the participants' personal development as colleagues and leaders.

The training program at Company A was carried out by two course leaders, while only one of them carried out the training at Company B. Between the meetings, the course leaders were available for ongoing support by phone or email.

Data collection

The training programs were followed by the research team from the beginning to the end. One researcher (CS, recruited as a senior researcher for this project only) participated in planning to align the research with the training program's needs but was not involved in decisions regarding the training's content or design.

Individual data was collected on three occasions from each training program before the first training session ($n = 28$), three months after completion of the training ($n = 30$), and at a seven-year follow-up, at which point many had found new job opportunities, and therefore were not included ($n = 14$) (see Table 1). The conditions for conducting the study did not change over time.

On all three occasions, interviews with open-ended questions were asked within a few predetermined themes linked to the purpose of the project and the content of the training. The participants were asked to describe how they experienced the training effort and the situation after the training. Except for the seven-year follow-up, data collection also included a questionnaire regarding work satisfaction and a survey of disruptions during the preceding three months. With a few exceptions, data collection took place through personal meetings with the respondents at one of the participating forestry companies' offices. In some cases, the interviews were conducted by telephone. One hour was allocated per respondent and session for data collection. The interviews were recorded using a mobile phone.

The seven-year follow-up

Due to personal circumstances, work on this manuscript was delayed for several years. This delay enabled an unplanned long-term follow-up, which provided an opportunity to find out what the participants remembered from the training and whether any of the outcomes from the previous follow-up could be observed.

The seven-year follow-up was based on telephone interviews only, lasting 30–60 min.

Work satisfaction questionnaire

A preliminary 34-item questionnaire assessing work satisfaction in the forestry industry was developed and administered in this study. Following the first data collection, an explorative factor analysis was carried out, based on a total of 28 survey responses. Such a limited number of responses is acceptable when the primary goal is to reduce the number of items of a questionnaire, within the context of a mainly qualitative study (Cudeck 2000). The statistical analysis resulted in five indexes with a total of 14 items. Each index had satisfactory homogeneity with Cronbach alpha >0.7 . Each index is reported as the mean value of the questions included in the respective index. The five indexes were: (1) *Follow-up of work*, (2) *Responsibility*, (3) *Health*, (4) *Quality*, and (5) *Developing dialogue*.

Survey of disruptions

A mapping of the time spent on different types of disruptions, delays and deviations in the respondents' daily work was carried out at the beginning of the project period. An anchoring model called Timeline follow-back (TLFB) was used (Sobell et al. 2001). It consisted of a calendar to make retrospective estimates of critical incidents 90 days before the interview. Memory aids, such as important dates, for example birthdays and holidays, were used to make it easier to remember.

Participant observations

In addition, two researchers (LW, employed as senior researcher at Skogforsk, and the research assistant MS, at the time employed as researcher at Skogforsk) participated as observers, one at a time, at a total of 7 whole-group training sessions to describe the training effort and how it was implemented in practice. They took notes, documented themes that were discussed and interventions from the trainers, but did not participate in the discussions.

Table 1. Number of respondents included before training, at three months after end of training and at the seven-year follow-up.

Category	Company A			Company B		
	Before training	3-month follow-up after completion of training	7-years follow-up	Before training	3-months follow-up after completion of training	7-years follow-up
Forest management staff	5	6	3	6	7	3
Contractors	9	8	5	8	9	3
Total	14	14	8	14	16	6

Analysis

The data collected from the questionnaire and the disruption survey do not meet the requirements for a quantitatively based analysis. However, within the context of a qualitative realist evaluation of the program theory, these data serve as valuable information for comparing the contexts of Company A and Company B, which is necessary to draw conclusions regarding Hypothesis 3.

Comparison of contextual factors of company A and company B

Both training programs were undertaken in similarly sized units within Swedish industrial groups that procure wood for sawmills and paper production while collaborating with private forest owners. Although minor differences existed in organizational structure and ownership, the companies were largely comparable. Their respective training programs were implemented in different regions of Sweden, Company A in the south and Company B in the north.

Questionnaire results on work satisfaction were stable over time and across both programs. Despite the small number of respondents, consistent patterns across sub-groups supported the reliability of the findings. Overall, participants were generally satisfied with their work situation, except regarding the follow-up of work (see Tables 2 and 3).

Follow-up practices, intended to involve dialogue and analysis during field visits and meetings, varied considerably in practice. Some contractors perceived follow-up more as control than as constructive dialogue. In contrast, responsibility was generally seen as clear by both contractors and forest management staff, with occasional uncertainties related to specific operational issues.

Contractors rated their health slightly lower than forest management staff but still found it satisfactory; interviews suggested contractors experienced more collaboration-related frustration. Most respondents found their work meaningful and were satisfied with its

quality. Both groups believed they had sufficient knowledge for constructive dialogue and reported mutual learning when meeting.

Disruptions, delays, and deviations were similar in both programs. Contractors mainly faced planning deficiencies that delayed logging, while forest management staff were burdened by administrative tasks and contractual disagreements. During and after harvesting, both groups dealt with operational and reporting issues. Time spent on such problems ranged from 29 to 57 h over three months (6–12% of working time). Although such issues may be considered part of normal work, they often cause frustration and stress, affecting cooperation and job satisfaction.

In conclusion, aside from regional differences, the two companies showed strong similarities in structure, tasks, work satisfaction, and the nature of work-related disruptions.

Results

The results are presented in three sections: the first addresses conclusions regarding goal attainment, the second presents our analysis of the five hypotheses and the third describes the refined program theory.

The extent to which the intended goals were achieved

The account below is structured according to the four levels of the Kirkpatrick model (Kirkpatrick and Kirkpatrick 2006). It is based on an analysis of each separate follow-up interview, in which statements have been categorized in line with the model.

Goal attainment at the three-month follow-up (results summarized in Table 4)

The participants of the *Company A* program expressed that the project had been valuable and that there had been an open atmosphere allowing free expression of thoughts and feelings during the meetings.

Table 2. Work satisfaction before the training program and three-month follow-up after end of training, Company A.

Work satisfaction index	Forest management staff				Contractors			
	Before training started (n= 4)		3-month follow-up after completion of training (n = 4)		Before training started (n = 8)		3-month follow-up after completion of training (n = 8)	
	M	Sd	M	Sd	M	Sd	M	Sd
Follow-up of work	2.4	1.1	2.8	0.7	2.9	1.2	2.5	1.2
Responsibility	3.8	0.7	3.8	0.6	4.3	0.7	4.0	1.0
Stress and health	4.8	0.5	4.8	0.5	3.6	1.3	3.8	1.3
Quality	3.8	0.8	4.1	0.8	4.1	0.9	4.4	0.6
Developing dialogue	4.1	0.5	4.2	0.7	4.0	1.1	3.9	1.1

Table 3. Work satisfaction before the training program and at three months after end of training, Company B.

Work satisfaction index	Forest management staff				Contractors			
	Before training started (n = 6)		3-months follow-up after completion of training (n = 6)		Before training started (n = 8)		3-months follow-up after completion of training (n = 8)	
	M	Sd	M	Sd	M	Sd	M	Sd
Follow-up of work	3.2	1.2	3.2	0.9	2.5	1.0	2.3	0.9
Responsibility	4.5	0.7	4.2	0.7	4.2	0.8	3.9	1.0
Stress and health	4.5	0.5	4.0	1.0	3.4	1.4	3.8	1.0
Quality	4.0	0.7	4.1	0.7	4.3	0.8	4.2	0.6
Developing dialogue	3.8	0.8	4.0	0.8	3.9	0.7	3.8	0.9

Table 4. Goal attainment at three months after completion of training.

Company A		Company B	
Reactions	A good step toward increased understanding.	Got to know each other better, but commitment would have been greater if the contractors had been involved.	
Impact on forest management staff			
Learning	Gained a holistic perspective on logging, and a better understanding of how different actors and people work and why.	Did not achieve their learning goals. Some had envisioned a ready-made toolbox for how to behave.	
Behavior	Positive development individually and in the group in terms of providing feedback, increasing contact with harvesting teams and initiating dialogue.	Increased trust in the feedback model, but difficulties in translating it into concrete action in the field.	
Organizational	It was difficult to use the methods when meeting someone who had not participated in the program.	It was a challenge to integrate the feedback model as a natural part of everyday work.	
Impact on contractors			
Learning	It was highlighted that a single meeting with a constructive dialogue often contributed to a holistic perspective of the business chain.	Company B contractors had nothing to report as they did not participate in the program.	
Behavior	They were confident that they had changed their behavior in line with the feedback model, which was regarded as a valuable tool.	There was no need to improve the relationship with production managers.	
Organizational	A majority used the feedback model also with their own employees. The atmosphere within their company was positively affected.	Nothing reported	

Most of the participants in the *Company B* program were positive about the project after they shifted the focus to the forest management staff and their personal development as colleagues and leaders. During the meetings, the participants were present and focused, while the active interest between the meetings was low. A common view was that the commitment of the participants would have been greater and that the effect on communication with the contractors would have been more effective if they had also been involved in the project.

Impact on forest management staff. All in *Company A* responded that their understanding of the entire forest chain had increased. They described a positive development, applying the feedback model, and how they still considered how the business development dialogue should be initiated and implemented.

We have learned to ask open questions and to have an exploratory attitude. (FM B)

However, there was a fear that interest in the issues that had been taken seriously during the project was at risk of dying out over time.

We who have been involved in the dialogue project have the mindset with us, but it is very difficult to

implement this with someone who does not know what it is about. (FM E)

Most of the participants in *Company B* expressed that they believe in the benefits of the feedback model. One challenge was that it was easy to fall back into old patterns, especially when one was stressed, and if one had not thought through the conversation in advance.

I have become better at listening, turning it around, that the performer is the expert and that I ask the question, instead of coming up with the answers. (FM G)

The participants wondered how to keep the positive things alive that emerged during the program. Some called for the involvement of senior management.

I think it would have been good if management had been clearer about what they expect. (FM F)

Impact on contractors. Some contractors in *Company A* program said that through a constructive dialogue with the other participants they got a holistic perspective on the chain. The feedback model was thought of as a valuable tool for how to conduct a dialogue. The contractors were confident that they had changed their behavior.

I have learned to listen more, then it is easier to have a dialogue – a new way of thinking that I think is positive. (C G)

Four of the five participating contractors said that they had used the feedback method with their employees in their own company. Their opinion was that the atmosphere was positively affected.

Now we can instead come out into the woods and ask, “how did you think it went, are you satisfied with your work?” Then the employees become more open and want to explain and tell us what they have done. It feels like we have received good feedback from all sides. (C H)

Company B contractors had nothing to report, for the simple reason that they did not participate in the teaching and learning activities.

Development of teamwork

The overall picture regarding the relationship between the participants in the *Company A* program was positive at the three-month follow-up. They felt that the dialogue had increased and worked better with most of those who were involved in the program. The relations became more open, trusting and professional. At the beginning of the project certain topics were sensitive to discuss, for example, the quality of the harvest plan. At the end of the project, there was less prestige in the group, and they solved problems together.

According to the forest management staff, contractors became more knowledgeable and approached contract negotiations differently than they had previously, making more informed and specific demands. This development was viewed positively, despite resulting in longer negotiation processes. It is reasonable to assume that the improved quality of the contract contributed to more favorable financial outcomes for both parties.

The sense of teamwork had developed, but there was a need to continue quality improvement within *Company A*. Some of the contractors would have liked the change to be faster and pointed out that some of the forest management staff did not seem to have learned from the conversations. They experienced that it took a long time to get answers to simple questions, and that feedback often seemed to get stuck somewhere along the way, so that it did not reach the person who carried out a task in the field.

We have become tighter as a group – we have more freedom and can work in the same direction. (C J)

The climate is more open and more trusting – we are more comfortable with each other; you can ask a “stupid” question. (FM D)

Differences in outcome between forest management staff in the two programs

The absence of contractors in *Company B*'s program created a different experience for its participants compared to those in *Company A*. Ultimately, the *Company B* program addressed only one of the four originally formulated goals – establishing conditions for dialogue and communication – whereas the *Company A* program engaged with all four.

Participants in *Company B* reported a generally positive experience and stated that they gained valuable insights into dialogue and communication applicable to their daily work. However, their engagement between meetings was low, and they saw little need to improve relations with contractors. The supervision meetings were nevertheless highly valued, particularly when they focused on practical, shared problems that fostered group cohesion. The feedback model was considered useful but difficult to apply in practice, especially with contractors who did not fully understand its purpose.

In contrast, the participation of contractors in the *Company A* program enabled both groups to address practical communication challenges together. The forest management staff became aware of their own difficulties and developed personal coping strategies. Practicing the feedback model with contractors appeared to increase their confidence in using it, even though, as in *Company B*, they found it challenging to apply with individuals unfamiliar with this communicative approach. The key element in the learning process was the discussion of recognizable, real-world work problems. Participants found the feedback model useful and learned to implement fundamental conditions for dialogue and communication.

A major distinction between the two programs was that the *Company A* group achieved, at least partially, all four program goals. They developed a broader understanding of the entire forest management chain and a deeper appreciation of each other's working conditions and realities, including those of the contractors. Compared to *Company B*, they also identified organizational culture elements in need of improvement, particularly planning, follow-up, and feedback. Moreover, teamwork between contractors and forest management staff showed positive development, although some contractors noted that the forest management staff were slow to integrate lessons from feedback discussions.

Long-term effects

Seven years is a long time in organizational life. Both *Company A* and *Company B* had made structural

changes in their organization, and the pandemic had lasting effects in that forest management staff and contractors met less often in person. We wanted to know what the participants remembered from the training and if any of the positive outcomes from the previous follow-up could be observed.

Company A. Both the forest management staff and the contractors were aware of the purpose of the program and remembered well the core message of the training program. They described it in terms of creating knowledge about the importance of communication and creating understanding of the challenges contractors and clients deal with, in order to improve operations and profitability for both.

Better at constructive feedback between the parties, let the other person talk to the point, talk until finished, the executor reports first. (FM C)

Collaborate, more dialogue. Not just say "What the hell!" More dialogue. Everyone should feel like a winner. (C I)

Some of the forest management staff said that they still used the feedback model. They believed it should be more widely applied both internally in the company and in collaboration with contractors. The contractors still used the feedback model in practice. They said that it worked well with employees, other contractors and even with competitors. However, they were disappointed that it was not applied in practice by Company A staff.

We had constructive conversations. It lives in the sub-conscious; it still carries over into the way we work. (FM C)

Yes, it worked in the beginning. Then not so well. Easier with our own staff. We use it often with our own staff. It lives there. (C H)

The forest management staff identified high staff turnover and less physical meetings as factors that prevented dialogue competence from developing in the company. It was suggested that the model should be introduced to new employees in combination with some kind of refresher for those who already know about the model. The contractors had the experience that communication worked well shortly after the end of the program, but that the positive outcome gradually faded. Some of the contractors were quite frustrated. However, on the positive side, it must be added that some contractors have used the feedback model in their own companies with their own staff.

Contractors think it's worse now. The digital and the pandemic contributed to fewer physical meetings now. It makes it harder with business skills which are based on trust and good relationships. Also difficult to convey this attitude to the new staff. (FM A)

In our own company, things have gone well. The dialogue project has been useful in our own company. ... The program worked well for us and for a few among the forest management staff. (C G)

Company B. The forest management staff remembered the purpose of the program in terms of improving communication between contractors and forest management staff. They also remembered that the core message was about feedback, but some needed to be reminded to be able to remember exactly how the dialogue was supposed to be structured. The contractors had only a vague idea about the program and could not give any example of effects of the program in their relationship with forest management staff.

About feedback. How it is received. How different people react. (FM D)

It was about increasing the understanding between those in the field and the forest management staff. Don't know what the training was about or what they learned. (C J)

The forest management staff said that the program had a lasting effect on how they worked together as a group and in relation to contractors and their employees. They thought that they had kept the dialogue alive and were listening more. The contractors could not identify any behavioral changes as an effect of the program but were satisfied with the relationship with the forest management staff.

It got better, not the same group anymore, but we are better at listening to each other. This comes up regularly in courses. (FM D)

We haven't noticed anything. No, nothing that I remember. ... Pretty much daily telephone contact with the forest management staff. (C P)

The forest management staff indicated that they had made significant progress; however, they noted a lack of support and insight from senior management. They believed that if dialogue adds value, it constitutes a management and governance issue that requires follow-up and implementation. Contractors reported a decline in their relationship with the forest management staff, attributing this change to organizational restructuring rather than the program itself. Additionally, they expressed concerns

regarding the younger forest management staff's insufficient knowledge of forest areas.

The process is too little in focus, only performance targets. We should allow the contractor to take ownership, but we are not there. The practitioner is an expert. We should be more open to dialogue. But we are not there. (FM F)

The production supervisors' work would be much easier if the planners had done the right thing. After the restructuring, there are "more downspouts and less gutters" at Company B. The different parts are not in contact. There was better coordination before. (C O)

Analysis of hypotheses

Increased understanding of the forestry value chain and of each other's working conditions gave the program meaning for participants and fostered trust in both course management and one another. The findings thus support Hypothesis 1: effective and sustainable collaboration between contractors and forest management staff requires (1) a shared understanding of the entire forest value chain and (2) insight into each other's working conditions and practical realities.

Forest management staff in Company A initially viewed the feedback model positively. Nevertheless, its use declined over time. This outcome relates to Hypothesis 2, which concerns the availability of resources, time, ongoing skills development, and senior management support, outlined in the program theory. These conditions were met during the training program period. However, after the training program concluded, support for dialogue skills diminished; such skills were perceived as incongruent with the broader organizational culture. There was insufficient time to consolidate learning, no structured opportunities for continued exchange of experiences, and no active engagement from senior management in sustaining these competencies. This case study suggests that long-term resource allocation and broader organizational involvement are essential for sustaining such programs. Acceptance of a dialogical approach and the normalization of feedback practices require engagement beyond a small local unit and commitment at the organizational level.

Most of the criteria for effective teamwork appeared to be met at the short-term follow-up of the Company A project. Participants reported that collaboration had improved, becoming more open and characterized by greater mutual trust, thereby supporting Hypothesis 3a. Developing teamwork between representatives of

different systems requires the active participation of members from both systems.

At the long-term follow-up, however, team spirit appeared to have weakened. The program theory should therefore be supplemented with a factor frequently emphasized in team development research: the need for regular evaluation, follow-up meetings, and feedback on team processes (Hackman 2002; West 2012; Salas et al. 2025). Without scheduled opportunities to reflect on collaboration, teamwork tends to deteriorate over time. The absence of such follow-up was one reason for the decline in teamwork. A second reason, noted in connection with Hypothesis 2, was the lack of organizational support.

Participants in Company B attempted to apply the skills they had developed in their interactions with contractors but encountered difficulties due to the contractors' limited understanding of the revised approach. Support for Hypothesis 3b – concerning how skills are manifested in interactions with members of other systems – was therefore weak, particularly given that the contexts of the two training programs were similar in the assessed dimensions.

Participants in both training programs emphasized the importance of explicitly linking course content to the challenges of their daily work and reacted negatively when the material was perceived as overly theoretical. Thus, Hypothesis 4, that training should be grounded in participants' everyday work experiences, was supported.

From the interview responses, it appears that the trainer in Company B devoted substantial time at the outset to explaining the work's theoretical basis and providing instructions, which many participants perceived as overly theoretical. The underlying issue, however, was a mismatch between participants' expectations for a ready-made toolbox for handling specific situations and the trainer's aim of teaching the fundamentals of dialogue, such as active listening and mutual reflection within a dynamic process. Program theory should emphasize preparing participants to ensure understanding of training objectives and methods.

The tension between participants' desire for explicit behavioral guidance and the trainer's focus on dialogue fundamentals did not surface immediately. Trainers must foster a sense of safety essential for group learning; however, this can inadvertently delay the surfacing of latent conflicts. Overemphasis on neutral topics early can hinder meaningful development, as progress depends on addressing and processing conflictual themes (Hypothesis 5). Achieving this balance requires careful judgment of the group's readiness to engage in

conflict, a challenge successfully navigated in Company B when training shifted toward teamwork among forest management staff.

Hypothesis 5, that a training program aiming to instill new attitudes and ways of working proceeds through phases before trust and accountability are established, was only partly investigated but supported by the Company B process. The need to address emerging conflicts early should be explicitly integrated into program theory, alongside maintaining structure and regularly reinforcing training objectives, thereby facilitating the constructive surfacing and processing of latent conflicts (Wheelan 2005).

Refined program theory

Based on the analysis of outcomes and basic assumptions, hypotheses, we propose the following context-mechanism-outcome (CMO) configuration to guide the future implementation of training programs aimed at strengthening dialogue and establishing structured processes for business development discussions.

Context

- Collaboration between forest management staff and contractors occurs within complex interdependent systems.
- Participants have diverse expectations, experiences, and understandings of each other's roles and the broader forestry value chain.
- Organizational support, resources, and culture influence the sustainability of learned behaviors.

Mechanisms

1. Shared understanding and insight: Increasing participants' comprehension of the forestry value chain and each other's working conditions fosters meaning, trust, and mutual accountability.
2. Dialogical skill development: Structured training in dialogue fundamentals (active listening, reflection, feedback) promotes new attitudes and collaborative behaviors, provided participants are adequately prepared and expectations aligned.

3. Practical grounding: Linking training content explicitly to participants' everyday work enhances engagement and perceived relevance.
4. Psychological safety and conflict processing: Facilitating early recognition and constructive engagement with conflicts enables deeper group learning and trust-building.
5. Sustained support and reinforcement: Regular follow-up, evaluation, and organizational backing consolidate learning and maintain collaborative practices over time.

Outcomes

- Short-term: Improved openness, mutual trust, and teamwork across participants.
- Medium-term: Application of dialogical skills in cross-system interactions, contingent on contextual alignment and partner readiness.
- Long-term: Enduring collaboration and normalized feedback practices, dependent on continued organizational support, structured reflection, and phased development of trust and accountability.

Causal pathway

When participants are adequately prepared, training is grounded in real work challenges, and organizational support is present, dialogical skill development and shared understanding are activated, fostering trust and improved collaboration. Over time, sustainability of outcomes requires reinforcement through follow-up, feedback, and continued organizational engagement.

Corollaries

- Early mismatch between participant expectations and training goals can undermine engagement; explicit preparation and expectation-setting are crucial.
- Neutral or overly theoretical content early in training may inhibit conflict engagement and deeper learning; trainers must balance safety with challenge.
- Without regular evaluation and reinforcement, teamwork and dialogical behaviors tend to erode, highlighting the importance of ongoing organizational support.

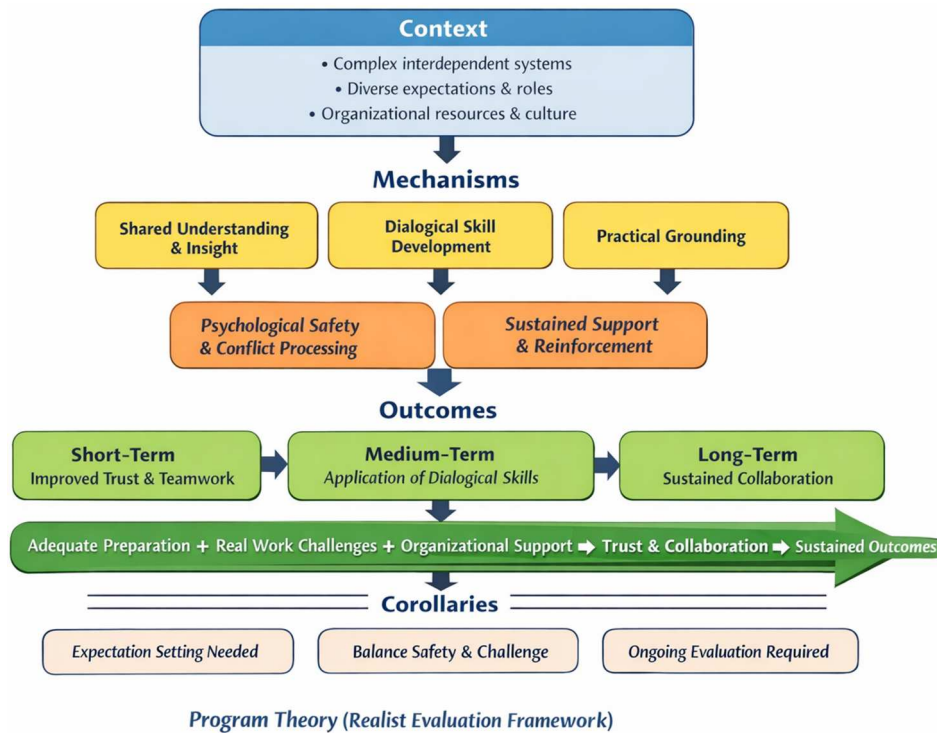


Figure 1. The image illustrates a conceptual framework detailing the development and outcomes of a program, emphasizing the importance of dialogue, psychological safety, and sustained support for fostering trust and collaboration within an organization.

Discussion

To our knowledge, this is the first realist evaluation of a forestry-industry training program designed to strengthen contractor-client dialogue. Although team training has consistently been shown to improve teamwork processes and performance (Kluger and DeNisi 1996; Salas et al. 2008; Salas et al. 2013; Eklof and Ahlborg Jr 2016; Lee 2022; Salas et al. 2025), research on interventions aimed at improving collaboration across organizational boundaries remains limited. Existing studies primarily focus on managers' boundary-spanning roles in multiteam systems (e.g. Moynihan and Ingraham 2004), rather than on developing dialogical skills among operational personnel. Our findings therefore extend knowledge on both contractor collaboration in forestry and interorganizational teamwork more broadly.

A central finding was that improving collaboration between contractors and forest managers requires active participation from both parties. To support this conclusion, we first established that Companies A and B were comparable in contextual factors likely to influence collaboration. Structural and organizational characteristics, job satisfaction, and the frequency and nature of operational disruptions, including the time required to resolve them, were similar across the

companies. Although the influence of unmeasured factors, such as organizational culture or historical working relationships, cannot be excluded, the findings indicate that dialogue training is unlikely to produce its intended outcomes unless both contractors and forest managers participate. This interpretation aligns with Döös and Wilhelmson's (2011) argument that collective learning emerges through the reciprocal imprinting of participants within a shared arena of action.

Company A achieved all interim program goals except fully cohesive teamwork, which was only partly realized. Contractors and forest managers reported increased understanding of the forestry value chain and of each other's working conditions. Both groups also identified dialogue and its practical application as key learning outcomes, and these perceptions remained remarkably consistent between the three-month and seven-year follow-ups, indicating sustained changes in participants' understanding. The findings from the short-term follow-up are consistent with previous research, whereas studies examining long-term outcomes remain scarce (Salas et al. 2012; Barrios-Fleitas et al. 2026).

Both interventions highlighted the need to strengthen routines for planning, follow-up, and feedback. Given the high turnover among production

managers, systematic onboarding to the feedback model is likely to be essential for maintaining improvements. More broadly, sustained implementation depends on continued senior management commitment. Without active leadership support for a dialogical culture throughout the organization, anticipated improvements in collaboration and profitability are unlikely to be fully realized (Edmondson 1999; Schein 2010).

A key feature of the training was the principle that the person performing the work is best positioned to evaluate its quality. This approach assumes an organizational culture in which practical experience is recognized as a legitimate source of expertise, irrespective of formal education or hierarchical position. In both companies, however, expertise appeared to be associated primarily with managerial roles, making the dialogical approach unfamiliar to many participants. Because this perspective challenges established norms regarding expertise and authority, its implementation requires explicit support from senior management (Moullin et al. 2018).

The long-term sustainability of the intervention was most evident among the contractors. Among Company A contractors, the feedback model remained in active use seven years after the training, both within their own organizations and in collaboration with other contractors. This sustained use may partly be explained by the fact that participants were owner-managers with the authority to implement organizational changes. It may also reflect a perceived long-term contribution of the model to organizational profitability.

According to the forest management staff, contractors became more knowledgeable and approached contract negotiations in a more informed and constructive manner than before. Although negotiations required more time, this development was viewed positively because it reflected greater mutual understanding and more balanced discussions. From a business perspective, longer but higher-quality negotiations may improve decision quality, strengthen trust between partners, and facilitate agreements that better align operational expectations. Over time, these relational benefits may reduce misunderstandings, conflicts, and coordination costs, thereby contributing to more efficient collaboration and improved organizational performance, provided that trust is maintained (Mayer et al. 1995; Zaheer et al. 1998).

However, maintaining trust requires ongoing interpersonal interaction beyond the negotiation process itself. At the seven-year follow-up, participants expressed concern, and in some cases frustration, that the increased use of digital tools had reduced the frequency of face-to-face interactions between contractors and forest managers. They perceived that this

development was diminishing forest managers' practical understanding of contractors' day-to-day work, potentially undermining mutual trust. This finding highlights an important managerial challenge associated with the digitalization of collaborative work. Although digital technologies and online meetings offer advantages in terms of convenience, flexibility, and cost efficiency, they may also weaken the social ties that underpin long-term business relationships. A key characteristic of effective teamwork is reflexivity – that is, opportunities for collective reflection, discussion, and feedback on collaborative processes (Hackman 2002; West 2012). Previous research has similarly highlighted these challenges while identifying promising approaches for strengthening online communication and supporting effective team processes in increasingly digital work environments (Keppler and Leonardi 2023; Barrios-Fleitas et al. 2026).

A key implementation challenge was the mismatch between the trainer's intention to provide practical learning experiences through a structured approach and participants' perception of the program as overly theoretical. This discrepancy was likely reinforced by participants' limited involvement in the preparatory phase, resulting in unclear expectations and an insufficient understanding of the program's purpose and methods. The implementation challenges observed in Company B might have been reduced through clearer alignment between the trainer and the company and more thorough participant preparation before the program commenced (Lencioni 2002; Salas et al. 2013). Accordingly, the program theory places greater emphasis on participant preparation to establish a shared understanding of the program's objectives, rationale, and training methods.

Overall, the findings indicate that dialogue training is most effective when implemented as an organizational change process rather than as a stand-alone educational intervention. Successful implementation involves practical work before, during, and after the training to integrate dialogue into everyday organizational practice. This includes preparing participants, communicating the purpose and expected outcomes of the initiative, and creating opportunities to apply and reflect on dialogue in daily work. Managers play a central role throughout the implementation process by allocating time and resources, modeling dialogical behaviors, embedding dialogue and feedback into regular work routines, and reinforcing learning through continuous follow-up and reflection. Training should be closely connected to participants' everyday work, foster a shared understanding of the forestry value chain, develop dialogical competencies, and provide psychologically safe opportunities

to engage in constructive conflict. Trainers support implementation by aligning participant expectations, balancing conceptual input with practical exercises, facilitating group development, and adapting the training to participants' evolving needs and organizational context.

Methodological issues

Within the realist-evaluation tradition, mixed qualitative and quantitative data are preferred. We initially planned to supplement interviews with questionnaires and the Timeline Follow-Back method but could not collect enough data for meaningful quantitative analysis. Nonetheless, the available data provided valuable contextual information and contributed to meaningful comparisons between the two companies. The absence of objective outcome data is a limitation; consequently, conclusions about the program theory rest primarily on interview analyses.

Qualitative sample adequacy was justified using the concept of information power. Malterud et al. (2016) argue that smaller qualitative samples are appropriate when a study has high information power, reflected in a narrow aim, high sample specificity, use of established theory, strong interview dialogue, and a case-based analytic strategy. This study met the proposed criteria, except that it used cross-case rather than case-based analysis. Accordingly, including 14–16 participants per program at each wave (6–8 at the seven-year follow-up due to attrition) was considered adequate for qualitative analysis.

The program theory was reconstructed retrospectively from the preexisting training design rather than developed prospectively, representing a departure from standard realist evaluation practice. Although the initial theory captured the program's main theoretical assumptions, it did not fully conform to context-mechanism-outcome (CMO) logic. Comparing observed outcomes with intended goals enabled refinement of the program theory, resulting in a clearer CMO-informed framework that more accurately reflects the program and provides a practical resource for future implementation.

A training program based on the proposed program theory should be accompanied by a research team that evaluates its effects using quantitative and qualitative methods, including economic analyses. Real-world observational approaches, such as shadowing participants in their daily work, could complement these methods by providing rich contextual data. Together, these approaches would enable a more comprehensive assessment of the

program's effects on organizational culture and financial outcomes.

Conclusion

Strengthening collaboration between forestry contractors and forest managers requires participation from both parties and the integration of dialogue and feedback into everyday work. In this study, the training increased participants' understanding of the forestry value chain and of each other's working conditions, while the feedback model remained in use among contractors and a small number of forest managers seven years after the intervention. However, maintaining these changes required management support, routines for planning, follow-up and feedback, and opportunities for continued interpersonal interaction. The findings therefore indicate that dialogue training is unlikely to produce lasting changes in contractor-client collaboration when implemented as a stand-alone educational intervention; its effects depend on whether the participating organizations incorporate the learned practices into their regular ways of working.

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Author contributions

CRediT: **Christer Sandahl:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing; **Lotta Woxblom:** Data curation, Formal analysis, Investigation, Project administration, Supervision, Writing – original draft.

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